

REMARKS/ARGUMENTS

Applicants respectfully request reconsideration and allowance of this application in view of the amendments above and the following comments.

Claim 13 was rejected under 35 USC § 112, second paragraph, as being indefinite. In response, Applicants have changed the dependency of claim 13 to claim 5.

Claims 1, 3-8, 10, 11 and 13-18 were rejected under 35 USC § 103(a) as being obvious over Beer, US 3,711,385, in view of Ioroi et al. (“Ioroi”), *J. Electrochem. Soc.*, 147: 2018-2022 (2000), optionally further in view of Bestaoui et al. (“Bestaoui”), *Chem. Mater.*, 9: 1036-1041 (1997). In response, Applicants respectfully submit that the cited combination of references does not make out a *prima facie* case of the obviousness of the rejected claims. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

According to *Manual of Patent Examining Procedure* (“MPEP”) § 2143:

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest *all* the claim limitations.”

Main claim 18 requires in step a) “preparing *colloidal* iridium oxide by a process comprising * * *. ” The Examiner alleges that the main reference, Beer, teaches the formation of colloidal iridium oxide, and points to Beer’s abstract, column 2, lines 20-42, and column 11, lines 50-65. However, none of those portions describe the iridium oxide as being colloidal, and Applicants respectfully submit that Beer’s iridium oxide is not, in fact, colloidal. If the Examiner should maintain this rejection, then Applicants respectfully request that the Examiner explain in detail where Beer teaches formation of colloidal iridium oxide either expressly or inherently.

Applicants respectfully submit that Beer does not, in fact, teach formation of colloidal iridium oxide. An aspect of the present invention as claimed is that Ir-oxide is present as a colloidal solution and that this solution is directly used. Thus, step a) of main claim 18 requires that colloidal iridium oxide is prepared, and step b) requires that “the colloidal iridium oxide resulting from a)” is optionally coated onto a surface. Claim 1 requires that such coating take place, i.e., coating is mandatory, not optional. “Colloidal” means to any person skilled in the art that the particles are dissolved and that these particles cannot be separated from the solution by filtration or any other separation procedure. This solution can only be obtained by increasing the pH value to at least 12.

It is important for the coating process of present invention that the Ir oxides which are obtained in situ are applied to the surfaces, dried and fired. This processing has the advantage that the IrO_x particles have a very small particle size in the range of nanometers and show a very small particle size distribution. Further, applying the oxides directly has the advantage that firing the oxides avoids the release of noxious substances such as chlorine compounds.

Furthermore, the instant inventors found out that the electrodes obtained by the process of present invention show significant enhanced properties in the oxidation ability compared with electrodes obtained according to the processes of the state of art.

Beer discloses an electrode for use in an electrolytic process. In example 11, the preparation of such an electrode is disclosed. The electrode is coated with a mixture of rhodium oxide (50 %) and iridium oxide (50 %). The starting materials, rhodium and iridium salts, are dissolved in water in the desired ratio and precipitated by means of a base, and, thereafter, the mixture is converted into the oxide by means of an oxidant, such as oxygen gas. The mixture of oxides thus obtained is milled or finely divided in any other manner and then dispersed in a liquid carrier.

According to Beer's example 12, the obtained dispersion can be stabilized by means of a protective colloid (s. example 12, column 12, lines 25 ff.), *however, the particles are not present in the colloidal form.*

Thus, an important difference between the disclosure of Beer and the subject matter of present claims is that the present claims require the preparation of colloidal IrO_x per se, and further that coatings prepared are applied to the surfaces by using a colloidal IrO_x comprising IrO_x obtained *in situ* and subsequently dried and fired. Colloidal IrO_x , once again, means that the oxide is present in a colloidal dissolved form and not in the form of a powder which may be filtered.

Beer does not teach such colloidal iridium oxide and this gap in Beer's teachings is not remedied by either Ioroi or Bestaoui. Thus, the cited combination of these references cannot possibly make out a *prima facie* case of the obviousness of any of the rejected claims.

Ioroi discloses iridium oxide/platinum electro catalysts for unitized regenerative polymer electrolyte fuel cells. On page 2018 it is disclosed that the iridium oxide is prepared by dissolving an appropriate amount of an iridium salt in a NaOH aqueous solution. The solution was held for reaction several hours and then the pH was lowered to ~8 by dropwise addition of 0.1 M HClO₄ solution. After cooling down the solution already 200 mg of ascorbic acid was added. At the end a precipitate was obtained which was separated in order to obtain iridium hydroxide hydrate powder.

Thus, as was the case with Beer, nowhere does Ioroi teach or suggest colloidal iridium oxide. Importantly, Ioroi does not bridge the gap between Beer and the rejected claims.

The same applies to Bestaoui, wherein a soluble iridium salt is used to which LiOH was added. After addition of LiOH, a colloidal suspension is obtained, however, the suspension is heated at 180 °C to allow the initial particles to aggregate (s. p. 1039, left column, lines 2/3). Thus, even if in Bestaoui the presence of colloidal iridium oxide is disclosed, the colloidal solution is **not** used but it is further processed in order to obtain solid particles in the form of a black powder.

Consequently, in the combination of cited references, there is no teaching or suggestion to prepare colloidal iridium oxide by the process of main claim 18 and then to use the colloidal iridium oxide obtained to coat a surface as required by claim 1.

In view of the foregoing, Applicants respectfully submit that the cited combination of references fails to make out a *prima facie* case of the obviousness of the rejected claims. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw this

rejection. An early notice that this rejection has been reconsidered and withdrawn is earnestly solicited.

Applicants believe that the foregoing constitutes a bona fide response to all outstanding objections and rejections.

Applicants also believe that this application is in condition for immediate allowance. However, should any issue(s) of a minor nature remain, the Examiner is respectfully requested to telephone the undersigned at telephone number (212) 808-0700 so that the issue(s) might be promptly resolved.

Early and favorable action is earnestly solicited.

Respectfully submitted,
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